Sante Fe sPHENIX MAPS Workfest: Simulations (Blue Team)

Blue Team:
D. McGlinchey, T. Frawley, J. Huang, D. Perepelitsa, S. Lim, K. Liu, E. Sichtermann, X. Li

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Necessary Simulation Improvements

Overview

1. Import ALICE ITS Stave geometry into GEANT4
   - **[Mike M]** – $\sim$??
   - Geometry file in hand (Mike M.)?
2. Build Ladder geometry in GEANT4
   - **[Tony]** – $\sim$ 1 month (after stave geo)
   - Replication & Positioning (all 3 layers)
   - Easily extend to all layers
3. Code for extracting & digitizing energy deposition
   - **[Tony]** – $\sim$ 1 month (after geo)
4. ~~Generic pattern recognition (Hough)~~ ✓
5. General Kalman filter
   - **[Haiwang]** – $\sim$ 1 month
   - In parallel to 1-4
6. Generic vertexing algorithm
   - **[Sanghoon]** – $\sim$ 2 months
   - Multi-vertexing capabilities
   - Displaced vertexing
   - Package RAVE under consideration (needs covariance from Kalmen fitter)

MAPS Simulation tasks

- **Generic**
  - [] – $p + p$ event pileup due to integration time
- **Upsilons**
  - [] – Outer tracking radii with realistic MAPS tracker
  - [] – Radiative tails for full MAPS tracker
  - [] – Conversion background (photon conversions) rejection for full MAPS tracker
- **B jets**
  - [] – Tagging performance & efficiency for multiple large *DCA* tracks
  - [] – Performance & efficiency of secondary vertex reconstruction
- **Jet substructure**
  - [] – Missing energy measurements
  - [] – Resolving jet fragments in Au+Au events
    - ★ Medium p_T tracks in a dense tracking environment (control of fakes, etc?)

Thank You!